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THE IMPACT OF POOR SANITATION ON TOURISM DEVELOPMENT: A GLOBAL REVIEW

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ABSTRACT

Aim: The objective of this paper is to review the impact of poor sanitation on global tourism development. **Methodology and Results:** The majority of the data for this study was sourced from World Development Indicators (WDI) dataset for more than 200 countries in 2014 from the World Bank. A regression analysis was applied to analyze the impact of access to improved sanitation on tourism development by using some indicators such as the number of tourist arrivals, the proportion of the population using improved sanitation facilities, and the proportion of the population using improved water facilities. The study found that the relationship between the proportion of the population using improved sanitation facilities and the number of tourist arrivals is significant. Poor sanitation has been shown to have huge negative impacts on public health and the economy. In terms of the economic impacts, the lack of access to improved sanitation causes economic losses related to the direct costs of treating sanitation-related diseases and the indirect cost of lost income through reduced productivity. **Conclusion, significance, and impact study:** Access to basic sanitation facilities is regarded as one of the aspects that should be considered to support the tourism industry, particularly in developing countries. This study suggests that providing sanitation is the best investment for promoting tourism. Decision-makers should act now, and in a concerted way, to provide adequate sanitation services and at the same time sustaining tourism growth as an essential aspect of a country's economy.

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1. INTRODUCTION

Globally, there are 1.5 billion international tourist arrivals recorded in 2019 which also a 4% increase in the previous year, confirming tourism as a leading economic sector (United Nations World Tourism Agency, 2020). As one of the world's most significant economic activities, tourism drives economic revenue, regional development, and employment (Qureshi *et al.,* 2017). It generates US$7.6 trillion or 10.2% of global GDP while providing 292 million jobs (Musavengane, Siakwah, and Leonard, 2020). Therefore, the increased inflow of tourists will contribute to higher revenue.

However, the tourism industry is one of the most vulnerable industries to critical situations, such as outbreaks, natural disasters, and terrorism issues (Hall, Timothy, and Timothy, 2003). These events and their impacts on the tourism industry are not new. However, the ability and capability of tourism management to deal with crises and complex situations are minimal (Santana, 2003).

In order to avoid any potential crisis and to sustain tourism growth, ensuring amenities and access to adequate public facilities is imperative. Therefore, one of the essential facilities that should be considered to support tourism development is sanitation services (Ali *et al*., 2018). According to WHO, sanitation is the provision of facilities and services for the safe disposal of faces and human urine (Zhou *et al.,* 2018).

As the tourism industry is very sensitive to perceptions or images (ADB, 2014), hence, if the visiting tourists are dissatisfied with sanitation facilities in a country, they are likely not to visit again and discourage other potential tourists as well. It is also acknowledged that the absence of appropriate wastewater sanitation is one of the leading killers in the developing world (Winters, Karim, and Martawardaya, 2014). Poor sanitation coupled with poor hygiene and inadequate quantities and quality of clean water is responsible for water, sanitation and hygiene (WASH)-related diseases (Van Minh and Hung, 2011; Hutton, Haller and Bartram, 2007). Specifically, a lack of potable water and sewerage systems is strongly related to an increased incidence of infectious and transmissible diseases, including diarrhoea, cholera, soil-transmitted helminth, schistosomiasis and other water-related diseases (Boschi-Pinto, Velebit and Shibuya, 2008; Campbell *et al.,* 2014; Komarulzaman, Smits and de Jong, 2017; Wolf *et al.,* 2019).

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WHO (2019) mentioned that some 827,000 people in low- and middle-income countries die as a result of inadequate water, sanitation, and hygiene each year, representing 60% of total diarrhoea deaths. Poor sanitation is believed to be the leading cause in some 432 000 of these deaths but is mostly preventable by providing adequate sanitation facilities. These conditions potentially reduce the interest of tourists visiting areas that are prone to sanitation-related diseases. Further, inadequate sanitation facilities could result in the loss of tourism earnings.

Considering the importance of sanitation and the huge negative impacts of poor sanitation, sanitation should receive more considerable attention from the government, development partners, and the private sectors. However, while many researchers have extensively documented the impact of poor sanitation on health and economic cost of treating sanitation-related illness, much less is known about its risks related to another economic sector (Hutton *et al.,* 2007; Van Minh & Hung, 2011). In particular, the risks associated with the impacts of sanitation on the tourism sector have been neglected. Even though, research has mention that environmental impact was a factor to determine the wastewater treatment technology (Noor and Soewondo, 2018). Of course, the environment is include the tourisms inside it.

In this context, this study aims to analyze the impact of sanitation on global tourism development. Further, this paper examines the argument that improved sanitation will boost tourism development and lead to an increasing contribution of the tourism sector to the nation's economy. Specifically, the research question for this paper is: does the access of sanitation have a significant impact on the number of tourist arrivals internationally? Through this paper, it also has a purpose to emphasize the critical relationship between proper sanitation and tourism development which can potentially be input for tourism-related policies in the future.

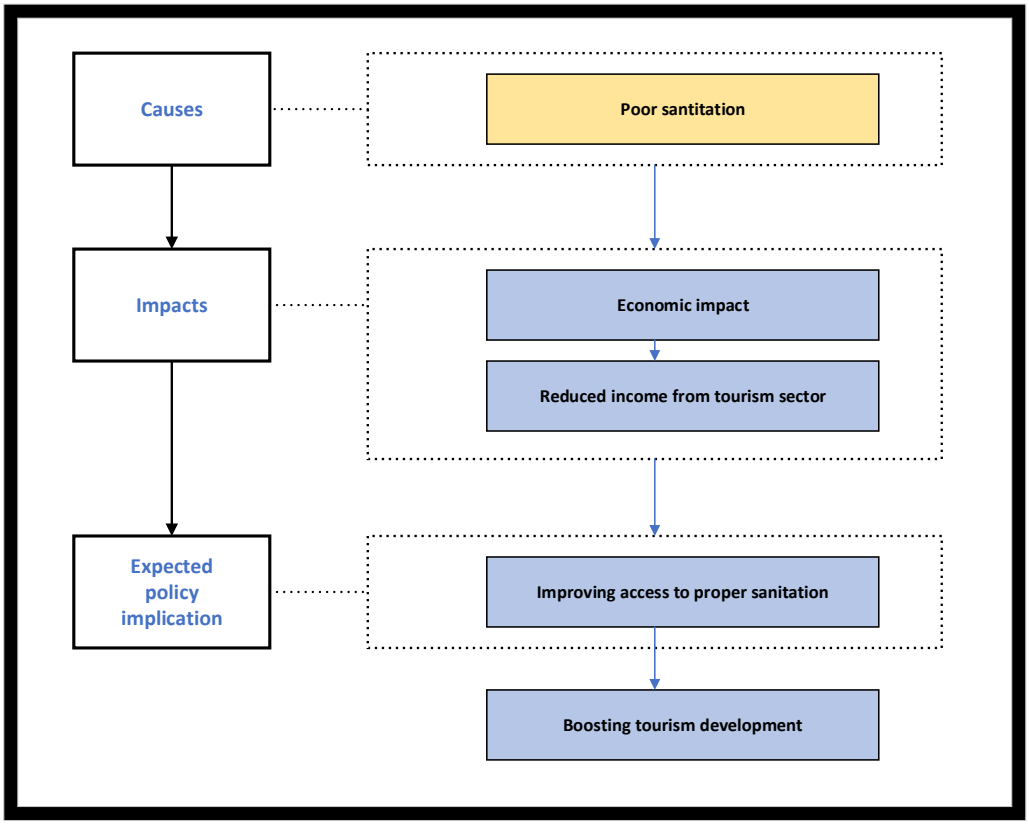

Figure 1 Conceptual framework

2. RESEARCH METHOD

This paper examined the relationship between international tourism and access to improved sanitation. The hypothesis being explored is whether, as the literature suggests, access to safe sanitation has a positive impact on tourism development. To analyze the impact of access to safe sanitation on tourism development, a regression analysis was applied. Regression is studying the relationship between one dependent variable and one or more independent variables (Diez and Cetinkaya-Runde, 2015).

The majority of the data for this paper was sourced from the World Development Indicators (WDI) dataset in 2014. It is from the World Bank Data Bank. The Development Data Group of the bank coordinates a database that draws much of its data from the statistical systems of member countries, so the quality of the data depends on these national systems.

As the international tourism indicator, the number of tourist arrivals was used to show the level of tourism activities in each country, according to Qureshi *et al.,* (2017). Based on the

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World Bank, (2014), the number of tourist arrivals refers to the number of tourists who travel to a country, whose primary purpose is visiting for a period not exceeding 12 months. The indicator unit is million arrivals.

As an indicator of access to sanitation, the proportion of the population using improved sanitation facilities (%). Historically, the safe access to toilets and the management of excreta have also become the basic targets for global sanitation (Zhou *et al.,* 2018). The United Nations (UN) with its members and many international organizations have launched programs to deal with the negative impacts of poor sanitation on human health and the environment. In the 1990s, 192 UN member countries and at least 23 international organizations agreed to the Millennium Development Goals (MDGs) at the World Summits.

Related to sanitation target, target 7C of MDG was intended to halve the number of people around the world using unimproved sanitation facilities by 2015. In this regard, the terms of improved and unimproved (poor) sanitation were applied. Improved sanitation consists of a flush or pour-flush toilet to a piped sewer system, a septic tank or pit latrine; a ventilated improved pit latrine (VIP); a pit latrine with slab; or a composting toilet. An improved sanitation facility is one that hygienically separates human excreta from human contact. Improved sanitation generally involves physically closer facilities, less waiting time, and safer disposal of excreta (Hutton and Haller, 2004; Van Minh and Hung, 2011; WHO (World Health Organization); UNICEF (United Nations International Children's Emergency Fund), 2015). Unimproved (poor) sanitation refers to several unsafe methods for disposal of excreta such as a flush/pour flush to elsewhere, a pit latrine without a slab, a bucket, a hanging toilet or hanging latrine, no facilities, or a bush or field (WHO-UNICEF, 2010).

Access to clean water was added as the other independent variables in the model. Water and sanitation are linked in many ways. Sanitation has become one of the most significant factors for actually achieving clean and secure water for all (Bartram, 2008). Universal access to sanitation is "not only fundamental for human dignity and privacy but is one of the principal mechanisms for protecting the quality" of water resources (Langford and Russell, 2017). Without a clean, safe source of water nearby, it is nearly impossible for communities to have proper sanitation facilities or practice good hygiene. Likewise, without adequate sanitation, safe water will become contaminated, and water projects will no longer work to improve health

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(Granados and Sánchez, 2014; Esrey *et al.,* 1991; Wright, Gundry and Conroy, 2004; Patunru, 2015).

Therefore, some variables were used according to the literature and their availability as mentioned below:

Dependent variable (Y):

- Tourist: international tourism, number of arrivals

Independent variables (X):

- Sanitation: the proportion of the population using improved sanitation facilities (%)
- Water: the proportion of the population using improved drinking-water sources (%)

The expected impacts of independent variables (sanitation and water) on the number of tourist arrivals are presented in Table 1 and data related to these variables are summarized in Table 2 below:

Table 1 Expected relationship of independent variables on the dependent variable

Variable	Category	Expectations on the impact on tourism
Tourist	Dependent variable	Not Applicable
Sanitation	Independent variable	Positive – linear
Water	Independent variable	Positive – linear

Table 2 Data summary

Variable	Obs	Mean	Std. Dev.	Min	Max
tourist	221	3.24e+07	1.16e+08	1300	1.10e+09
water	220	88.74674	14.28317	39.9	100
sanitation	221	72.87453	28.54647	6.7	100

Each independent variable was individually regression toward the number of tourist arrival. The following formula provides the regression equation for international tourism:

$$Log\ (Y) = b_1 + b_2X_2 + b_3X_3 + e \quad (1)$$

Y : international tourism, number of arrivals

b_1 : the intercept

X_2 : improved sanitation facilities (% of population with access)

b_2 : an increase in X_2 by one unit (c.p.) increases Y by 100 x b_2 per cent

X_3 : improved water source (% of population with access)

B_3 : an increase in X_3 by one unit (c.p.) increases Y by 100 x b_3 per cent

e : residual term

3. RESULTS AND DISCUSSION

Poor sanitation has become a global concern (WHO, 2012). The absence of improved sanitation and wastewater services has become the main problem in many developing countries. One of the impacts of poor sanitation is a reduced income from another sector such as tourism due to a high risk of contamination and disease (Hutton et al., 2007; Mensah and Enu-Kwesi, 2018).

In this regard, this study examined the relationship between international tourism and access to improved sanitation. The estimation results of the model are recorded in the Tables below.

Table 3 Estimation results on regression tourist and sanitation

```
. reg ltourist sanitation
```

Source	SS	df	MS	Number of obs	=	206
				F(1, 204)	=	26.91
Model	135.194476	1	135.194476	Prob > F	=	0.0000
Residual	1024.88542	204	5.02394815	R-squared	=	0.1165
				Adj R-squared	=	0.1122
Total	1160.0799	205	5.65892634	Root MSE	=	2.2414

ltourist	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
sanitation	.0290537	.0056007	5.19	0.000	.018011	.0400965
_cons	12.51079	.4427264	28.26	0.000	11.63789	13.3837

The first regression is to show the individual relationship between access to sanitation and the number of tourist arrivals. The result shows that an increase in % of the population with access to improved sanitation facilities by 1 % (c.p.) increases the number of tourist arrivals by 2.9 %. Here the P-value is significant.

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The overall explanatory power of the model is provided by the coefficient of determination adjusted for degrees of freedom (R2). Here, the R2 value of 0.12 suggests that the model can explain around 12 % of the variation in tourist arrivals.

The results of the first regression showed that the relationship between access to improved sanitation and is significant. It also means that access to improved sanitation has a positive impact on tourism development. In line with this, the theory suggests that the macro-economic costs of poor sanitation and sanitation-related diseases are very high, including lost income from the tourism sector (Mara, 2003). Poor sanitation can cause pollution to surface water and groundwater, and inadequate wastewater treatment systems have a direct impact on water and environmental pollution which potentially affect the tourism industry inversely (Frone and Frone, 2013). Also, a high risk of contamination and disease due to poor sanitation potentially reduce the interest of tourists to come which then leads to a reduced income from the tourism sector (Hutton *et al.,* 2007; Mensah and Enu-Kwesi, 2018). Therefore, investment in safe sanitation services potentially generates many significant economic benefits from tourism sector (Frone and Frone, 2013).

Further, the next regression included access to improved drinking water sources as an additional independent variable.

Table 4 Estimation results on regression tourist, water, and sanitation

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. reg ltourist water sanitation
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Source	SS	df	MS	Number of obs	=	202
				F(2, 199)	=	13.87
Model	140.440181	2	70.2200905	Prob > F	=	0.0000
Residual	1007.34376	199	5.06202897	R-squared	=	0.1224
				Adj R-squared	=	0.1135
Total	1147.78395	201	5.71036789	Root MSE	=	2.2499

ltourist	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
water	.008481	.0202512	0.42	0.676	-.0314534	.0484154
sanitation	.0263611	.009926	2.66	0.009	.0067874	.0459347
_cons	11.97322	1.287601	9.30	0.000	9.434127	14.51231

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The result showed that a 1% increase in the population with access to improved sanitation is associated with a 2.6 % increase in the number of tourist arrivals. Here, the relationship between the proportion of the population using improved sanitation facilities and the number of tourist arrivals is significant. In this regard, this result indicates that access to sanitation is one of the vital aspects of supporting tourism development.

Further, a 1% increase in the population with access to the improved water sources is associated with a 0.8% increase in the number of tourist arrivals. These results indicate that the regression may suffer from omitted variable bias if relevant variables are not included. There is a need for further study to explore other variables that might be related to sanitation and tourism development.

4. CONCLUSION

Foreign investment in the tourism sector and the number of tourist arrivals considerably sustain the tourism industry and boost economic growth accordingly. Many things need to be considered in order to increase tourism development. Access to basic sanitation facilities is regarded as one of the aspects that should be considered to support the tourism industry, particularly in developing countries.

As the tourism industry is susceptible to perceptions or image, access to sanitation issues become particularly important in forming the image of the tourist destinations in the country. Tourists revealed the high risk of contamination and disease, and the associated costs. Therefore, the governments and policymakers need to ensure the population access to improved sanitation in developing countries.

Many efforts have been made to improve sanitation services by international organisations and many countries which mostly developing ones; however, inadequate sanitation facilities remain to persist. There is an ongoing concern that this condition threatens many aspects of livelihood, including tourism. In this regard, this study shows that access to sanitation is vital in supporting tourism development. Therefore, this study suggests that providing sanitation is the best investment for promoting tourism. Decision-makers should act now, and in a concerted way, to provide adequate sanitation services and at the same time sustaining tourism growth as an essential aspect of a country's economy.

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